

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date
3 June 2004 (03.06.2004)

PCT

(10) International Publication Number
WO 2004/045857 A3

(51) International Patent Classification⁷: B41M 5/24, 5/26, 5/40, 3/06

(21) International Application Number:
PCT/US2003/036222

(22) International Filing Date:
12 November 2003 (12.11.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0226597.3 14 November 2002 (14.11.2002) GB

(71) Applicant (for all designated States except US): SUN CHEMICAL CORPORATION [US/US]; 222 Bridge Plaza South, Fort Lee, NJ 07024 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): LUCAS, Olaf [DE/DE]; Adam-Stegerwald-Strasse 17, 63811 Stockstadt (DE). KROTH, Dagmar, Maria [DE/DE]; Darmstädter Landstrasse 215, 60598 Frankfurt (DE). THAI, Quang, Minh [DE/DE]; Trieler Ring 80, 63500 Seligenstadt (DE). LANGE, Frank [DE/DE]; Alexanderstrasse 17, 64342 Seeheim-Jugenheim (DE).

(74) Agent: PERSLEY, Sidney; 222 Bridge Plaza South, Fort Lee, NJ 07024 (US).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
8 July 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 2004/045857 A3

(54) Title: LASER MARKING PROCESS

(57) Abstract: Thin, flexible plastic films, of the type used for the packaging of foodstuffs, may be printed using a laser marking technique by printing a layer or layers comprising a laser sensitive material and an ink so that heating of the laser sensitive material by absorption of laser radiation burns the ink selectively, so causing markings to appear. A further process for marking a flexible plastic material using a laser is disclosed, whereby to a surface of a substrate comprising said flexible plastic material a laser sensitive material which is or is associated with a material that generates gas on heating is applied, this is coated with a gas impermeable layer, then exposed to laser radiation such that raised markings appear on the exposed portions.

INTERNATIONAL SEARCH REPORT

on Application No

PCT/US 03/36222

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 B41M5/24 B41M5/26 B41M5/40 B41M3/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 IPC 7 B41M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC, IBM-TDB

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 066 437 A (KOESSLINGER ROBERT) 23 May 2000 (2000-05-23) cited in the application column 3, line 46 - column 5, line 45; figure 1	1-4,6-9
X	US 6 259 465 B1 (HEETDERKS JAMES P ET AL) 10 July 2001 (2001-07-10) column 2, line 40 - column 3, line 6 column 4, line 5 - line 61 column 6, line 5 - line 41	1-4,8,9
X	EP 0 526 396 A (FERCHIM ENG SA) 3 February 1993 (1993-02-03) page 2, line 31 - page 3, line 10 page 3, line 36 - page 4, line 12 page 5, line 52 - page 6, line 21	5
		-/-

 Further documents are listed in the continuation of box C. Patent family members are listed in annex.

° Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the International filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the International filing date but later than the priority date claimed

- "T" later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

18 May 2004

Date of mailing of the international search report

01/06/2004

Name and mailing address of the ISA

 European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax. (+31-70) 340-3016

Authorized officer

Balsters, E

INTERNATIONAL SEARCH REPORT

	ational Application No PCT/US 03/36222
--	---

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 443 639 A (EASTMAN KODAK CO) 28 August 1991 (1991-08-28) claim 1; examples 1,2 -----	1,3,4, 6-9
X	EP 0 419 377 A (BLANCOMME ; MERLIN GERIN (FR)) 27 March 1991 (1991-03-27) column 2, line 16 - column 3, line 27 column 5, line 17 - line 21; claims 7,9 -----	1,3,4, 6-9
A	DE 196 46 331 A (FRAUNHOFER GES FORSCHUNG) 14 May 1998 (1998-05-14) the whole document -----	5

INTERNATIONAL SEARCH REPORT

Information on patent family members

National Application No

PCT/US 03/36222

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 6066437	A	23-05-2000	DE AT AU DE DK WO EP ES NO PT	19642040 C1 200650 T 4616997 A 59703393 D1 866750 T3 9816397 A1 0866750 A1 2159151 T3 982560 A 866750 T	15-01-1998 15-05-2001 11-05-1998 23-05-2001 13-08-2001 23-04-1998 30-09-1998 16-09-2001 04-06-1998 30-10-2001
US 6259465	B1	10-07-2001	DE GB JP	19951276 A1 2344434 A ,B 2000141891 A	18-05-2000 07-06-2000 23-05-2000
EP 0526396	A	03-02-1993	AT DE DE EP JP US	135638 T 69209185 D1 69209185 T2 0526396 A1 5208597 A 5325781 A	15-04-1996 25-04-1996 01-08-1996 03-02-1993 20-08-1993 05-07-1994
EP 0443639	A	28-08-1991	US CA DE DE EP IE JP JP SG	5061341 A 2032115 A1 69100363 D1 69100363 T2 0443639 A1 910266 A1 2846966 B2 4220180 A 118993 G	29-10-1991 26-07-1991 21-10-1993 05-05-1994 28-08-1991 31-07-1991 13-01-1999 11-08-1992 15-04-1994
EP 0419377	A	27-03-1991	FR FR DE DE EP ES	2652480 A1 2654982 A1 69025686 D1 69025686 T2 0419377 A1 2086389 T3	29-03-1991 31-05-1991 11-04-1996 26-09-1996 27-03-1991 01-07-1996
DE 19646331	A	14-05-1998	DE	19646331 A1	14-05-1998